CalPERS

Investment Office
P.O. Box 2749
Sacramento, CA 95812-2749
Telecommunications Device for the Deaf - (916) 795-3240
(916) 795-3400

December 17, 2007

AGENDA ITEM 4b

TO: MEMBERS OF THE INVESTMENT COMMITTEE

I.	**SUBJECT:**	Strategic Asset Allocation Recommendation
II.	**PROGRAM:**	Total Fund
III.	**RECOMMENDATION:**	a) Adopt the Asset Allocation Policy Mix A as shown in Table 1. Alternatively, the Investment Committee may wish to adopt Policy Mix B in Table 1.
		b) Adopt asset class ranges as shown in Table 2.
IV.	**ANALYSIS:**	

EXECUTIVE SUMMARY

Following the Asset/Liability Management (ALM) workshop, staff is presenting an agenda item seeking approval for a revised Asset Allocation Policy Mix based on the analysis below. In sum the recommendations lead to the following changes:

- Under Policy Mix A the Alternative Investment (AIM) allocation increases by 4% and Global Equity reduces by 4%, with Total Equity (Global Equity + AIM) unchanged at 66%. Allocations to Inflation-Linked Assets and Real Estate increase by a total of 7% and Fixed Income reduces by 7% from 26% to 19%.

   - Inflation-Linked Asset Class (ILAC) increases to 5% from 0% in current policy.

- Global Equity target reduces to 56% from 60% in current policy.

- AIM target increases to 10% from 6% in current policy.

- Real Estate Target increases to 10% from 8% in current policy.

- Global Fixed Income (GFI) target reduces to 19% from 26% in current policy.

- Under Mix B, AIM increases by 3% and Global Equity reduces by 3% with Total Equity unchanged at 66%. Inflation-Linked Assets and Real Estate increase by a total of 6% and Fixed Income reduces by 6% from 26% to 20%.

  - ILAC increases to 5% from 0% in current policy.

  - Global Equity target reduces to 57% from 60% in current policy.

  - AIM target increases to 9% from 6% in current policy.

  - Real Estate target increases to 9% from 8% in current policy.

  - GFI target reduces to 20% from 26% in current policy.

- The separate allocations to Domestic Equity and International Equity are now combined under a single Global Equity Asset Class.

Based upon Investment Committee voting preference and the weights assigned to the four decision factors, Asset Mix 14 was ranked highest among the 18 asset mixes. Staff arrived at Policy Mix A by rounding the target allocations in Asset Mix 14. Staff was directed to present an optimized asset mix with Real Estate constrained at 9% which is shown as Policy Mix B after approximation.

Policy Mix A has a marginally lower return and risk than Asset Mix 14 but has the same Sharpe ratio at 0.543. Asset Mix B has a marginally lower return and risk than Asset Mix A but has a slightly higher Sharpe ratio as indicated in Table 1.

TABLE 1

Asset Class	Current Policy	Asset Mix 14	Policy Mix A	Policy Mix B
Global Equity	60%	56.7%	56%	57%
AIM	6%	9.3%	10%	9%
Total Equity	*66%*	*66.0%*	*66%*	*66%*
Global Fixed Income (GFI)	26%	18.4%	19%	20%
Inflation-Linked Assets (ILAC)	0%	5.0%	5%	5%
Total GFI and ILAC	*26%*	*23.4%*	*24%*	*25%*
Real Estate	8%	10.5%	10%	9%
Total	100%	100%	100%	100%
Expected Return (Arithmetic)	8.920%	9.060%	9.057%	9.026%
Expected Return (Geometric)	8.35%	8.46%	8.46%	8.44%
Standard Deviation	11.140%	11.410%	11.402%	11.309%
Sharpe ratio	0.544	0.543	0.543	0.545

TABLE 2

Asset Class	Ranges Relative to Target
AIM	+/- 3%
Total Equity	+/- 5%
Total GFI and ILAC	+/- 5%
Real Estate	+/- 3%

During the discussion some committee members indicated a preference for an asymmetric range with a lower positive limit for Real Estate. To address this concern staff has recommended a lower range of +/- 3% compared to the old range of +/- 4% for Real Estate.

BACKGROUND

The Asset Allocation Policy recommended in this agenda item is the result of a process which has included:

1) The development of detailed quantitative models of the demographic and actuarial characteristics of CalPERS' constituent plans and the asset class input assumptions by consultants and staff (see Attachment 1),

2) The development of projections of possible future economic and capital market scenarios by consultants and staff which were used to evaluate alternative asset mix policies and their impact on contribution rates and liabilities.

3) A two-day Workshop (November 19 and 20, 2007) at which the projections from the models were presented and discussed,

4) Subsequent analysis based on voting by Investment Committee members on the relative importance of key "Decision Factors" affecting the asset mix policy decision as well as other factors which influence the final decision. Investment Committee adoption of an Asset Allocation Policy mix is the final step in the process.

OVERVIEW

During the ALM workshop staff presented an array of 18 viable asset mixes from a segment of the efficient frontier generated from the asset/liability inputs. The current policy mix plotted below this efficient frontier indicating that all 18 asset mixes were more "efficient" from a risk/return consideration. The 18 asset mixes were chosen for their optimal risk/return characteristics as well as their ease of implementation relative to the current policy mix. The 18 asset mixes range in expected return (arithmetic) from 5.60% to 6.40% and standard deviation from 9.63% to 12.03% for mix 1 to 18 as shown in Attachment 2. The efficient frontier is shown in Attachment 3.

DECISION FACTORS

Decision Factors are common sense measures of risk used to help the Investment Committee determine their aggregate level of risk tolerance. The four decision factors were approved by the Investment Committee at the 2003 ALM workshop. The same four factors were used in 2007, but the period was extended from 10 years to 15 years to provide a longer horizon.

TABLE 3

Decision Factor Number	Decision Factor	Decision Factor Measure
DF 1	Improve Funding	The funded ratio is to improve by 10% at the end of 15 years.
DF 2	Avoid Low Funding	The funded ratio is not to decrease below 80% from now to the end of 15 years
DF 3	Minimize Employer Contributions	The average employer contribution is to be as low as possible from now to the end of 15 years.
DF 4	Stabilize Employer Contributions	The employer contribution should not increase above 25% of payroll from now to the end of 15 years.

During the voting process, each Investment Committee member quantified the relative importance for each Decision Factor. The following Table 4 shows the final average weighting. Decision Factors 1 and 3 tend to favor equities and constitute 61.2% of the weight, indicating a greater tolerance for risk. Decision Factors 2 and 4, which indicate risk aversion, earned a 38.8% weight.

TABLE 4

	Decision Factors	Consensus
1	**Improve funding**	**35.7 %**
2	**Avoid Low Funding**	**14.6 %**
3	**Minimize Employer Contributions**	**25.5 %**
4	**Stabilize Employer Contributions**	**24.2 %**
	Total:	**100.0 %**

This weighting displayed Asset Mix 14 as the highest ranked candidate asset mix.

WEIGHTING DECISION FACTORS

A simulation model was used to rank the relative attractiveness of each of the 18 asset mixes based on the weighting of the Decision Factors. The asset mix with the highest score is representative of the risk appetite of Committee members in the aggregate as indicated by the voting process. The result of this ranking is shown in Table 5.

TABLE 5

Asset Mix	Satisfaction Scores
14	**5.62**
13	**5.62**
12	**5.58**
16	**5.55**
15	**5.54**

LIMITS OF QUANTITATIVE TOOLS

CalPERS has used the current methodology for over a decade to decide the policy asset allocation. This process employs mean-variance optimization to generate the efficient frontier for asset mixes and incorporates asset and liability factors in the decision factors and "surplus optimization". In 2007 a dynamic return model was used for the expected return of AIM and Real Estate rather than a hard constraint to limit the allocations to AIM and Real Estate. This results in a lower return for higher allocations in these private asset classes while the risk remains the same. This method is an improvement over hard constraints and better accounts for leverage and economic risks for higher allocation. The input assumptions and the quantitative tools in this process are imprecise and have limitations. Nonetheless, they provide a framework for decision-making and have produced reasonable results over the past decade based on expected and realized results. Input assumptions are shown in Attachment 1.

INVESTMENT COMMITTEE INPUT AT THE WORKSHOP

There was considerable discussion on the asset class input assumptions. These assumptions were agreed upon by the consultants and staff early in the process in order to conduct the optimization and simulation analyses. It is suggested that the input assumptions may be discussed with the Investment Committee early in the process next time.

ASSET CLASS DISCUSSION

INFLATION-LINKED ASSET CLASS (ILAC)

The Inflation-Linked Asset Class (ILAC) was introduced into the asset mix in the 2007 ALM workshop after many informational presentations and discussions with the Investment Committee in the 2006-2007 period. The ILAC pilot program was approved by the Investment Committee in September 2007 with a target allocation of 1.5%. ILAC comprises four components: Commodities, Inflation-Linked Bonds, Infrastructure and Forestland. Existing investments in Commodities, Infrastructure and Forestland amount to 0.7% of total fund based on October 31, 2007 market value. The Inflation-Linked Bond portfolio is not yet invested. Staff expects to deploy assets in the four component portfolios upon approval of the new strategic target allocation, the investment policy, and other pre-requisites. Staff expects that the new target allocation could be implemented over a three-year period. With the Committee's approval of the allocation to the ILAC, staff will proceed to take the steps necessary to make the asset class a permanent part of the portfolio.

REAL ESTATE

The proposed new targets for Real Estate represent an increase of 2% or 1% from the current policy target of 8%. The current invested allocation is 7.8% on a cash basis. Real Estate staff has proposed a new strategic plan with an emphasis on further diversification through a value add centric approach in terms of strategies and an increased international allocation. Staff believes that this approach will allow for additional deployment of assets. Capitalization rates have reached low levels due to higher valuations of real estate assets over the recent period. A slowdown in the U.S. economy may pose risks to current valuations, but could present new opportunities in the future. Staff is confident that new international opportunities combined with potential U.S. opportunities will enable new targets to be reached within a two-year period.

ALTERNATIVE INVESTMENTS (AIM)

The AIM invested allocation is currently 7.5% relative to the current policy target of 6%. Unfunded commitments are approximately $22 billion. Based upon new opportunities and unfunded commitments staff does not expect any difficulty in achieving the target of 10% over a two-year period. Credit markets have become tight in recent months posing some risks to large leveraged transactions. However, in view of the enlarged strategy for AIM with higher international allocations, staff is confident of achieving the targets in the near term.

GLOBAL EQUITY

In recent months staff has reduced Global Equity exposure to raise cash and for tactical allocation. These actions have reduced Global Equity invested allocation to 57.5% relative to the policy target of 60%. The additional reduction needed to reach the recommended target of 56% or 57% would be minor. More importantly the change to a global benchmark would require a shift of assets from domestic to international equity. This is addressed by Global Equity staff in a separate item. For the purpose of the ALM process the existing absolute return (RMARS) allocation within Global Equity, currently at 2.5% of total fund, is assumed to have equity characteristics although RMARS exhibits different characteristics. Global Equity staff expects to remedy this in 2008.

GLOBAL FIXED INCOME

The new targets for Global Fixed Income represent a reduction of 7% or 6% from current policy. Since much of this reduction goes to the new Inflation-Linked Asset Class which is to be invested over a period of three years, the fixed income allocation will be reduced gradually. For this reason the Global Fixed Income and Inflation-Linked Assets are combined to have a single range.

STAFF RECOMMENDATION

Staff recommends Policy Mix A in Table 1 based on consensus among the Senior Investment Officers and Chief Investment Officer. The alternative recommendation of Policy Mix B was arrived at by constraining Real Estate to 9%. Policy Mix B has a marginally lower expected return and risk than Policy Mix A and a slightly higher Sharpe ratio. The difference in the two asset mixes is marginal. Staff believes that either Mix A or Mix B would be optimal and viable for CalPERS.

CONSULTANT RECOMMENDATION

The opinion letters from Wilshire Associates and Pension Consulting Alliance, Inc. (PCA) are found in Attachments 8 and 9, respectively.

IMPLEMENTATION

The implementation plan is presented in a separate item under closed session.

ACTUARIAL COMMENTS

The actuarial funding ratio for CalPERS was 87.4% as of June 30, 2006. Attachment 5 shows the expected variation in funded status over a 15-year period for Asset Mix 14. At the end of 15 years the variation in funded status is 82% (10th percentile) to 170% (90th percentile) with a median of 110%. At the end of 15 years the probability of being 100% funded (Decision Factor 1) is 71.8% for Asset Mix 14.

The range of future employer contribution rates for Asset Mix 14 is shown in Attachment 6. The average employer contribution rate would be 8.28% over this period. The probability that employer contributions will increase above 25% (Decision Factor 4) at any time during the next 15 years is less than 1%.

Additional comments from the CalPERS Actuarial Office are found in Attachment 10.

SCHEDULING THE NEXT ASSET/LIABILITY MANAGEMENT WORKSHOP

It is proposed to conduct the next review of Asset/Liability Management (ALM) in 2010. Staff plans to review the current methodology and suggest any changes to the Investment Committee prior to the next ALM workshop.

V. STRATEGIC PLAN:

This item is consistent with Strategic Plan Goal VIII, manage the risk and volatility of assets and liabilities to ensure sufficient funds are available, first, to pay benefits, and second, to minimize and stabilize contributions. This item is also consistent with Goal IX, achieve long-term, sustainable, risk-adjusted returns.

VI. RESULTS/COSTS:

There may be transaction and market impact costs associated with the changes necessary to achieve the recommended asset policy mix. These costs cannot be precisely determined at this time, but will be small relative to the long term benefits of the revised asset mix policy.

_____   _____
Farouki Majeed   Theodore Eliopoulos
Senior Investment Officer   Senior Investment Officer

_____   _____
Leon Shahinian   Christianna Wood
Senior Investment Officer   Senior Investment Officer

_____
Curtis Ishii
Senior Investment Officer

_____
Russell Read
Chief Investment Officer